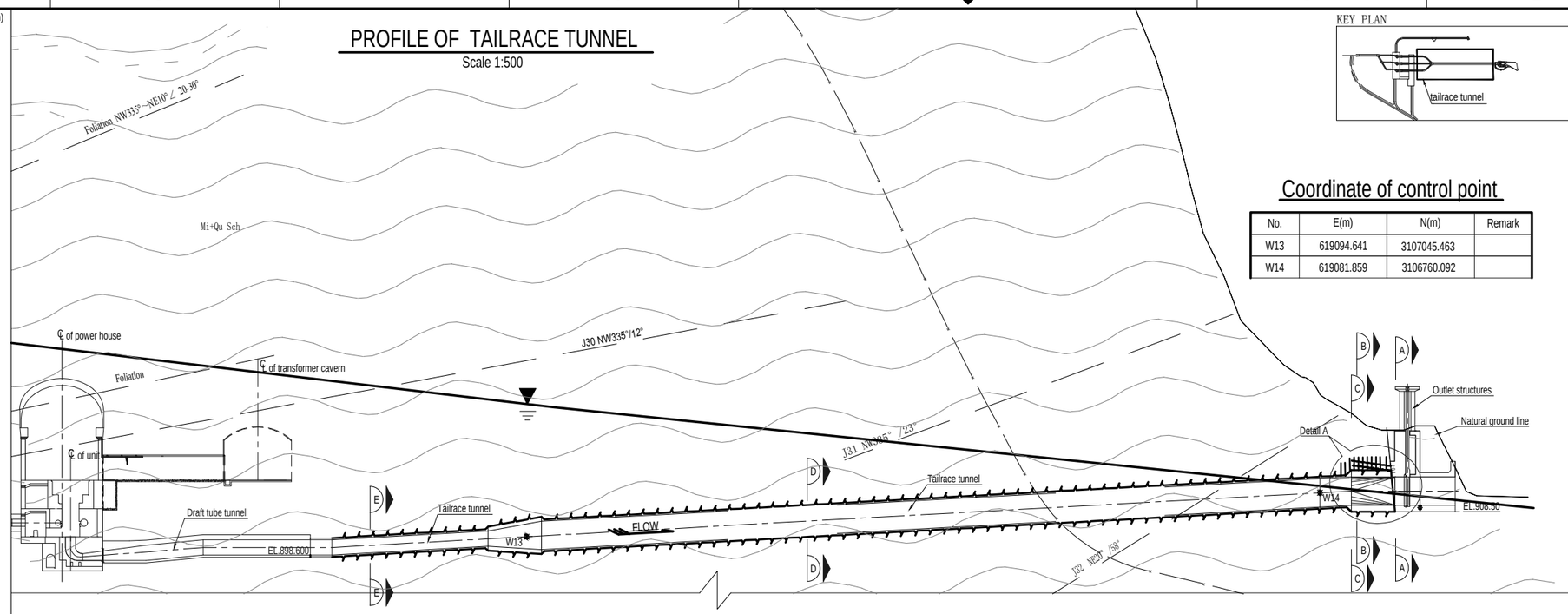
PROFILE OF TAILRACE TUNNEL

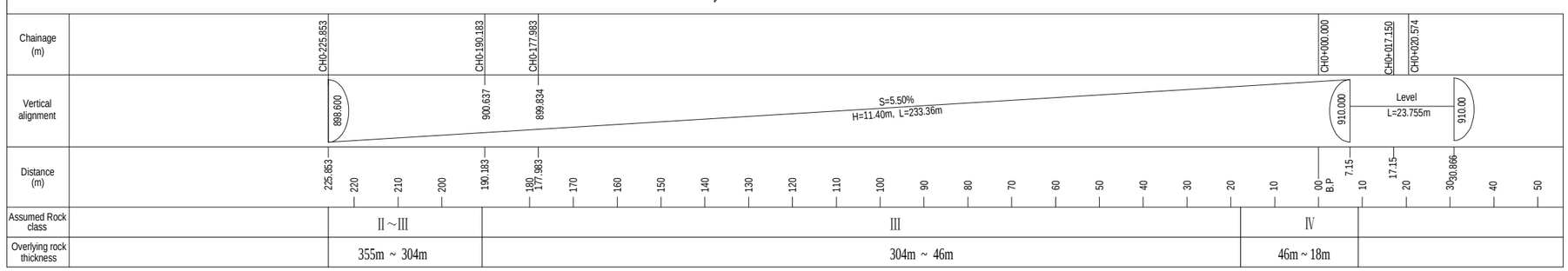
Scale 1:500



KEY PLAN

Coordinate of control point

No.	E(m)	N(m)	Remark
W13	619094.641	3107045.463	
W14	619081.859	3106760.092	



TUNNEL SUPPORT PATTERN(D-D)

Rock mass quality	40≥Q	10≤Q<40	4≤Q<10	1≤Q<4		Q<1
Support type	I	II	III	IV (Without steel support)	IV (With steel support)	V Same as type IV(With steel support)
Inner dimension(m)	R=3.25m					
Excavation Parameter						
ESR	1.6	1.6	1.6	1.6		1.6
Excavation span(m)	3	3	2	1.5		0.5~1
Calculated MUS*(m)	13	10	6	4		2
MUS* for shotcrete application(m)		10	4	1.5		2
MUS* for rock dowel installation(m)		6	4	3		0.5~1
MUS* for steel support installation(m)					0.5~1.0	0.5~1
Excavation method	Blasting			Blasting/mechanically		Mechanically
Initial support parameters						
Weep hole，Φ50mm,L=0.3m	where necessary					
Plastic fiber shotcrete,f'c=25MPa	Spot	T=50mm	T=80mm	T=100mm	T=160mm	For class V rock, the same support scheme as class IV rock can be adopted after grouting is used to improve the integrity and firmness of surrounding rock.
Rock dowel，D25,L=3m,alternately	Spot	@2.5m×2.5m	@2m×2m	@1.5m×1.5m	@1m×1m	
Steel support, MB150 (or lattice girder)					where necessary	
Forepoling grouted dowel,D25mm, @400mm, L=6m					where necessary	
*MUS，Maximum Unsupported Span.						

TUNNEL SUPPORT PATTERN(E-E)

Rock mass quality	40≥Q	10≤Q<40	4≤Q<10	1≤Q<4		Q<1
Support type	I	II	III	IV (Without steel support)	IV (With steel support)	Same as type IV
Inner dimension(m)	R=1.75m					
Excavation Parameter						
ESR	1.6	1.6	1.6	1.6		1.6
Excavation span(m)	3	3	2	1.5		0.5~1
Calculated MUS*(m)	13	12	6	4		2
MUS* for shotcrete application(m)		12	4	2		2
MUS* for rock dowel installation(m)		6	4	4		0.5~1
MUS* for steel support installation(m)					0.5~1.0	0.5~1
Excavation method	Blasting			Blasting/mechanically		Mechanically
Initial support parameters						
Weep hole，Φ50mm,L=0.3m	where necessary					
Plastic fiber shotcrete,f'c=25MPa	Spot	T=50mm	T=50mm	T=80mm	T=160mm	For class V rock, the same support scheme as class IV rock can be adopted after grouting is used to improve the integrity and firmness of surrounding rock.
Rock dowel，D25,L=3m,alternately	Spot	Spot	@2m×2m	@1.5m×1.5m	@1m×1m	
Steel support, MB150 (or lattice girder)					where necessary	
Forepoling grouted dowel,D25mm, @400mm, L=6m					where necessary	
*MUS，Maximum Unsupported Span.						

NOTE

1. This set of drawings are for the layout drawings of trilrace tunnel.
2. All dimensions are in millimeters, and coordinates, chainages & elevations are in meters.
3. The excavation and support methods can be adjusted according to the actual situation after the geological conditions are revealed.
4. It is evident that the maximum unsupported span is a guideline, only, and needs continuous adjustment to the prevailing rock conditions and construction requirements at the spot.
5. The scope of this set of drawings is from CH0-225.853 to tunnel portal, the rest will be prepared after draft tube design is completed.
6. The forepoling is mainly used in the tunnel section with poor surrounding rock geology, which should be used together with dowel and steel support（or lattice girder）, and the spacing of dowel should be consistent with that of steel support.
7. The detail of weep holes, rock dowel, steel support and steel lattice girder see the drawing No. UT1-C-000-CVL-DG-40001.
8. Other see sheet 2.

Scale:

1:500 0 5 10 15 20 25m

LEGEND

- Gneiss
- Interbedded Mica Schist and Quartz-Schist
- Inferred boundry between moderately weathered and slight weathered
- Inferred lithology boundry
- Joint number and attitude（Dip direction/Dip）
- Fault number and attitude（Dip direction/Dip）
- Inferred ground water level

REFERENCE DRAWINGS

UT1-C-070-CVL-DG-59001	LAYOUT OF TAILRACE SYSTEM
UT1-C-080-CVL-DG-59001	EXCAVATION AND SUPPORT DRAWING OF TAILRACE OUTLET GATE CHAMBER
UT1-C-000-CVL-DG-40001	DETAILED DESIGN DRAWING OF EXCAVATION AND SUPPORT FOR UNDERGROUND CAVERN

SYMBOL AND LEGEND

FOR APPROVAL

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A	16.APR.,2022	FIRST ISSUE	ZHANG KAI	ZHANG J.Q.	ZHANG FAN LI W.C.

PROJECT TITLE

Upper Trishuli-1 HEP (216MW)

OWNER

NWEDC NATIONAL WATER AND ENERGY DEVELOPMENT CO. (PVT.) LTD.

OWNER'S ENGINEER

TRACTEBEL ENGIE · jade CONSULT

CONTRACTOR

DOOSAN Doosan Heavy Industries & Construction

DRAWING TITLE

EXCAVATION AND INITIAL SUPPORT DRAWINGS OF TAILRACE TUNNEL (1/7)

INDEX	DRAWING NUMBER	SHEET NO.	REV. NO.
A	UT1-C-070-CVL-DG-59002-01	1 OF 7	0A

A1 (594 x 936 MM)